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EXAMINER	
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2153	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/668,253	BECHTOLSHEIM ET AL.	
	Examiner	Art Unit	
	Aaron Strange	2153	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 March 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-74* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-74* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 September 2000* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. Figures 1A, 1B, and 5 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 8 is objected to because of the following informalities: There appears to be a typographical error ---so that a size--- on line 2. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-40, 53-56,57 and 62 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. With regard to claim 1, the phrase --- Ethernet packet by inserting a header in place of a preamble within the packet --- is recited in lines 4-5. It is well known in the art that Ethernet packets have a single preamble. Since the Applicant claims the modification of a preamble of an Ethernet packet, the scope of the claim is unclear. The Office recommends that the claim be amended to recite --- Ethernet packet by inserting a header in place of the preamble within the packet ---.

6. With regard to claim 53, the phrase --- Ethernet packet by inserting a header in place of an Ethernet preamble within the packet --- is recited in lines 3-4. It is well known in the art that Ethernet packets have a single preamble. Since the Applicant claims the modification of a preamble of an Ethernet packet, the scope of the claim is unclear. The Office recommends that the claim be amended to recite --- Ethernet packet by inserting a header in place of the Ethernet preamble within the packet ---.

7. With regard to claim 57, the phrase --- Ethernet packet by inserting a header in place of an Ethernet preamble within the packet --- is recited in lines 3-4. It is well known in the art that Ethernet packets have a single preamble. Since the Applicant claims the modification of a preamble of an Ethernet packet, the scope of the claim is unclear. The Office recommends that the claim be amended to recite --- Ethernet packet by inserting a header in place of the Ethernet preamble within the packet ---.

8. Claim 62 recites the limitation "error protection field" in line 1. There is insufficient antecedent basis for this limitation in the claim. It appears that applicant meant “error detection field”, and the claim has been interpreted as such.

9. All claims not specifically referred to are rejected by virtue of their dependency on the above claims.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

11. Claims 1,2,10-13,16,24,25,28,32-35,39,40,45,53,56,57,65, and 70 are rejected under 35 U.S.C. 102(a) as being anticipated by Huang.

12. With regard to claim 1, Huang discloses a method for conveying network management information within a network, comprising: modifying the Ethernet packet by inserting a header in place of a preamble within the packet (Page 7, Example 2, Step 4), said header configured to provide support for network management (includes congestion notification information) (Pages 3-4, Section 2.1.1.2). Huang does not specifically disclose receiving an Ethernet packet at a network element and transmitting the modified packet from the network element. However, modifying the packet to provide support for network management is only useful in the context of receiving a packet, modifying it, and transmitting it. These are essential functions to a network and are present in the method disclosed by Huang despite the lack of a specific reference to them.

13. With regard to claim 2, Huang further discloses that the network element is in communication with an optical network (SONET) (Page 2, Lines 1-3).

14. With regard to claim 10, Huang further discloses that the network element is on the edge of an optical network (Receives Ethernet frames and sends them over SONET) (Page 2, Lines 1-3).

15. With regard to claim 11, Huang further discloses that said header includes application specific information (Variable field) (Page 2, Section 2.1.1, Lines 8-10).

16. With regard to claim 12, Huang further discloses that said header includes an error detecting code word to detect errors in the header (cHEC field) (Page 2, Section 2.1.1, Lines 11-12).

17. With regard to claim 13, Huang further discloses that said error detecting code word is a cyclic redundancy check (CRC-16) (Page 2, Section 2.1.1, Lines 11-12).

18. With regard to claim 16, Huang further discloses that said header includes packet type information (Type field) (Page 2, Section 2.1.1, Lines 6-7).

19. With regard to claim 24, Huang further discloses that the network has a ring topology (Page 1, Lines 1-3).

20. With regard to claim 25, Huang further discloses inserting an idle packet into a packet stream at the network element during periods when no data is received by the network element (Page 2, Section 2.1.2, Lines 4-6).

21. With regard to claim 28, inserting said header comprises inserting said header at an edge of the network since the insertion is performed by a network element to transport an Ethernet frame over a SONET network (page 2, Lines 1-7). This can only occur at the boundary between the Ethernet network and the SONET network.

22. With regard to claim 32, Huang further discloses multiplexing packet streams at the network element (Page 3, Section 2.1.1.2, Lines 1-3).

23. With regard to claim 33, Huang further discloses a subinterface identifier which identifies an originating port for each of the packets (Src Port field) (Page 3, Section 2.1.1.2, Lines 5-7).

24. With regard to claim 34, the packet streams must be demultiplexed at the receiving node in order to be read. Therefore, this feature is inherent to the system disclosed by Huang despite the lack of a specific reference.

25. With regard to claim 35, Huang discloses that the network comprises a plurality of network elements (2 elements in point to point connection) (Page 2, Lines 1-2).

26. With regard to claim 38, Huang further discloses receiving the modified packet at a transit node, modifying said header, and forwarding the packet (decrement TTL) (Page 3, Section 2.1.1.2, Lines 11-14).

27. With regard to claim 45, Huang discloses a system for conveying network management information in a network, comprising: a port controller operable to receive a packet, modify the packet by inserting a header in place of a preamble within the packet (Page 7, Example 2, Step 4), said header configured to provide support for network management (includes congestion notification information) (Pages 3-4, Section 2.1.1.2). Huang does not specifically disclose a network element controller coupled to the port controller and operable to generate and consume network management information. However, since the packet includes network management information including congestion notification, a controller must be present to generate and read values for this field or it would useless. Therefore, the network element controller is inherent to the system disclosed by Huang.

28. With regard to claim 46, the port controller must comprise an optical to electrical converter and a CDL handler operable to insert the header. These items are present because an optical to electrical converter is required in order to convert the electrical

signals that the network device generates into optical signals for transfer over the fiber. A CDL handler must also be present since Huang inserts the header into the packet, and a device must be present which is operable to perform that function. Therefore, these items are present in the system disclosed by Huang, despite the lack of a specific reference to them.

29. With regard to claim 47, a crossconnect configures to receive the packet from the port controller and select an egress port controller to transmit the packet from the network element must be present. As discussed regarding claim 45, the packet is transmitted from the port controller, so a device must be present that decides which port to transmit the packet from, or the packet would not be transmitted. Therefore, the device is present in the system disclosed by Huang despite the lack of a specific reference to it.

30. With regard to claim 53, Huang discloses a method for conveying network management information within a network, comprising: modifying the Ethernet packet by inserting a header in place of a preamble within the packet (Page 7, Example 2, Step 4), said header configured to provide support for network management (includes congestion notification information) (Pages 3-4, Section 2.1.1.2). Huang does not specifically disclose that the method is performed by a computer program product or the step of receiving an Ethernet packet at a network element and transmitting the modified packet from the network element. However, since network devices are performing the method and network devices are computers, the code and computer program product are inherent elements of the system as network devices are inoperable without

software. Furthermore, modifying the packet to provide support for network management is only useful in the context of receiving a packet, modifying it, and transmitting it. These are essential functions of a network and are inherent to the method disclosed by Huang.

31. With regard to 56, Huang further discloses providing each packet with a subinterface identifier within said header to allow multiplexing of packet streams (Src Port field) (Page 3, Section 2.1.1.2, Lines 5-7).

32. With regard to claim 57, Huang discloses a method for conveying network management information within a network, comprising: modifying the Ethernet packet by inserting a header in place of a preamble within the packet (Page 7, Example 2, Step 4), said header configured to provide support for network management (includes congestion notification information) (Pages 3-4, Section 2.1.1.2). Huang does not specifically disclose that the method is performed by a program or the step of receiving an Ethernet packet at a network element and transmitting the modified packet from the network element. However, since network devices are performing the method and network devices are computers, the code and computer readable storage are inherent elements of the system since the network devices are inoperable without software. Furthermore, modifying the packet to provide support for network management is only useful in the context of receiving a packet, modifying it, and transmitting it. These are essential functions of a network and are inherent to the method disclosed by Huang.

33. With regard to claim 65, Huang discloses a system for conveying network management information within a network, comprising: means for modifying the

preamble of the packet to support network management (remove preamble) (Page 7, Example 2, Step 4). Huang does not specifically disclose means for receiving a packet at a network element and transmitting the modified packet from the network element. However, modifying the packet to provide support for network management is only useful in the context of receiving a packet, modifying it, and transmitting it. These are essential functions to a network and are present in the method disclosed by Huang despite the lack of a specific reference to them.

34. With regard to claim 70, the network element is located at an ingress boundary of the network since the received packet is Ethernet, and the transmitted packet goes over the SONET network. The element is at the ingress boundary of the SONET network.

35. With regard to claim 74, as discussed regarding claim 65, the network element is a transit element since it receives the packet and transmits it to a second element.

Claim Rejections - 35 USC § 103

36. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

37. Claims 17,18,26,27,29-31,36,37,39-44,48-51,54,66-69,72 and 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang.

38. With regard to claim 17, while the system disclosed by Huang shows substantial features of the claimed invention (discussed above), it fails to specifically disclose that

the packet type information identifies whether the packet is an idle packet or a data packet.

However, Huang discloses the existence of idle packets and data packets, as well as a packet type information field which identifies the payload type (Page 2, Section 2.1.1, Lines 6-7). It would be advantageous to provide this information in the packet type field to make identification of idle packets and data packets easier.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the packet type information indicate whether the packet is an idle packet or a data packet because it would simplify the identification of each packet type since only one field must be compared.

39. With regard to claim 18, while the system disclosed by Huang shows substantial features of the claimed invention (discussed above), it fails to specifically disclose that the packet type information identifies that the Ethernet packet has been modified.

However, it would certainly be advantageous to know whether a packet has been modified. By notifying a network device that the packet has been modified, it can determine if the information in the header is correct. If the modification field is not set, then the device would know that the standard preamble is in the first 8 bytes, rather than the management header. This would prevent the preamble from being read as the management header, possible providing incorrect information to the network device. This would also allow the same network devices to transmit both standard and modified Ethernet packets over the same segment, reading the header only on the packets which have been identified as modified.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the packet type information identify that the Ethernet packet has been modified. This allows the receiving station to quickly and easily determine if a packet has been modified and prevent the preamble form being interpreted as a management header.

40. With regard to claims 26 and 27, while the system disclosed by Huang shows substantial features of the claimed invention (discussed above), it fails to disclose removing the header and replacing the preamble at an egress boundary of the network.

However, the preamble of an Ethernet packet is well-known in the art and predefined. Since a packet cannot travel over a standard Ethernet network without having a preamble, it is essential to replace the preamble of the packet if the packet must be forwarded over an Ethernet network. This would occur at a router located at an egress boundary of the network disclosed by Huang since the preamble must be replaced in order to travel over a standard Ethernet network.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to allow an Ethernet packet which has been previously modified to provide support for network management to be converted back into a standard Ethernet packet by replacing the management header with a standard Ethernet preamble.

41. With regard to claims 29 and 30, while the system disclosed by Huang shows substantial features of the claimed invention (discussed above), it fails to disclose

transmitting a defect indicator within said header or switching a receiving node to a backup path.

Huang does disclose a congestion notification field used to indicate congestion experienced along the link, to allow the receiving node to take action to avoid the congestion. It would be an advantageous and natural extension to indicate other defects detected on a link and have the receiving station switch to a backup path to alleviate congestion or ensure connectivity in the event of a failed link.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to transmit a defect indicator within said header and switch a receiving node to a backup path in the event that a major defect such as severe congestion or a failed link is detected.

42. With regard to claim 31, while the system disclosed by Huang shows substantial features of the claimed invention (discussed above), it fails to disclose providing an automatic protection switching subchannel within said header.

Huang does disclose a congestion notification field used to indicate congestion experienced along the link, to allow the receiving node to take action to avoid the congestion. It would be an advantageous and natural extension to indicate other defects detected on a link and have the receiving station switch to a backup path ensure connectivity in the event of a failed link.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide an automatic protection switching subchannel in

addition to the congestion indicator within said header in order to allow a receiving node to switch to a backup path in the event that a failed link is detected.

43. With regard to claim 36, while the system disclosed by Huang shows substantial features of the claimed invention (discussed above), it fails to disclose a network management station wherein the management station has access to said plurality of network elements via said header.

The use of network management stations (NMS) is well known in the art as a means for providing a single point for the network administrator to configure and monitor the network. While Huang does not specifically disclose the presence of a NMS on the network, they are commonly used. It would be advantageous to utilize an NMS and send management information from the network elements to the NMS via the header. This will allow the network administrator to access the information from the NMS and take appropriate action.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use an NMS and to have a header field configured to send management information to it from the network elements as a means for collecting the information in a central location for the network administrator to access.

44. With regard to claim 37, while the invention disclosed by Huang in view of Masucci et al. shows substantial features of the claimed invention (discussed above), it fails to disclose communicating routing table information among said plurality of network elements via said header.

Communicating routing tables is an essential activity performed by routing

networks, and many methods of doing so are well known in the art. Communicating routing table information via the header would allow the routing information to be communicated simultaneously with other data transfer without creating additional congestion in the network since the information piggybacks onto existing data packets.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to communicate routing information in the header. This allows the routing information to be sent without creating additional traffic on the network since the information piggybacks onto existing data packets.

45. With regard to claims 39 and 40, while the system disclosed by Huang shows substantial features of the claimed invention (discussed above), it fails to specifically disclose that the network element is in communication with at least one computer or at least one router.

However, host computers and routers are essential elements of a network, and are almost certainly in communication with the network element. These devices are well known in the art and are obvious additions to any network which the network device is in communication with.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have at least one host computer and/or at least one router in communication with the network device. These elements are essential to the existence of a network and most networks have a plurality of both such elements.

46. With regard to claim 41, Huang discloses modifying an Ethernet preamble by replacing it with a header configured to provide support for network management.

However, Huang fails to disclose converting the packet back to a standard Ethernet packet by replacing the header with a preamble.

However, the preamble of an Ethernet packet is well-known in the art and predefined. Since a packet cannot travel over a standard Ethernet network without having a preamble, it is essential to replace the preamble of the packet if the packet must be forwarded over an Ethernet network. This would occur at a router which is connected to a standard Ethernet network as well as a network which supports the method disclosed by Huang.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to allow an Ethernet packet which has been previously modified to provide support for network management to be converted back into a standard Ethernet packet by replacing the management header with a standard Ethernet preamble.

47. With regard to claim 42, as discussed regarding claim 41, the network element is located at an egress boundary of the network (SONET) (Page 2, Lines 1-3).

48. With regard to claim 43, since the preamble replacement occurs only at the edge of the network, the packet must be received from a transit network element located within the network, or it would not have had the preamble replaced with a header.

49. With regard to claim 44, Huang further discloses that the network element is in communication with an optical network (SONET) (Page 2, Lines 1-3).

50. With regard to claim 48, while the system disclosed by Huang shows substantial features of the claimed invention (discussed above), it fails to disclose a port controller

operable to receive the modified packet and replace the header with the preamble at an egress boundary of the network or a network element controller coupled to the port controller and operable to generate and receive network management information.

However, the preamble of an Ethernet packet is well-known in the art and predefined. Since a packet cannot travel over a standard Ethernet network without having a preamble, it is essential to replace the preamble of the packet if the packet must be forwarded over an Ethernet network. This would occur at a router located at an egress boundary of the network disclosed by Huang since the preamble must be replaced in order to travel over a standard Ethernet network. Huang does not specifically disclose a network element controller coupled to the port controller and operable to generate and consume network management information. However, since the packet includes network management information including congestion notification, a controller must be present to generate and read values for this field or it would useless.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to allow an Ethernet packet which has been previously modified to provide support for network management to be converted back into a standard Ethernet packet by replacing the management header with a standard Ethernet preamble.

51. With regard to claims 49 and 50, the port controller must comprise an electrical to optical converter, an optical to electrical converter, and a CDL handler operable to insert the header. These items are present because the converters are required in order to

convert the electrical signals that the network device generates into optical signals for transfer over the fiber. A CDL handler must also be present since Huang inserts the header into the packet, and a device must be present which is operable to perform that function. Therefore, these items are present in the port controller disclosed by Huang, despite the lack of a specific reference to them.

52. With regard to claim 51, Huang further discloses a transit element operable to receive the modified packet, modify the header (decrement TTL), and forward the packet to the second element (Page 3, Section 2.1.1.2, Lines 11-14).

53. With regard to claim 54, while the system disclosed by Huang shows substantial features of the claimed invention (discussed above), it fails to disclose removing the header and replacing the preamble.

However, the preamble of an Ethernet packet is well-known in the art and predefined. Since a packet cannot travel over a standard Ethernet network without having a preamble, it is essential to replace the preamble of the packet if the packet must be forwarded over an Ethernet network. This would occur at a router located at an egress boundary of the network disclosed by Huang since the preamble must be replaced in order to travel over a standard Ethernet network.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to allow an Ethernet packet which has been previously modified to provide support for network management to be converted back into a standard Ethernet packet by replacing the management header with a standard Ethernet preamble.

54. With regard to claims 66-69, while the system disclosed by Huang shows substantial features of the claime3d invention (discussed above), it fails to specifically disclose that the means for modifying the packet comprises hardware, microcode, software, or photonic logic.

However, these means of modifying the packet are well known in the art and each one would be acceptable for modifying the packet. They would be design choices made depending on various factors such as speed and cost. The choice of one or the other is not critical to the functionality of the invention.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use any means of modifying the packet which produces the correct result. Hardware, microcode, software, and photonic logic are all acceptable choices and the choice of one or the other would be driven by external factors such as speed or cost, and the choice would not affect the functionality of the invention.

55. With regard to claim 72, while the system disclosed by Huang shows substantial features of the claimed invention (discussed above), it fails to disclose that the network element is located at an engress boundary of the network.

Huang discloses a network element at the ingress boundary of the network which receives an Ethernet packet, and transmits it over the optical network. It would be advantageous to have a network element located at the egress boundary to accept optical packets and transmit them over an Ethernet network connected to the element.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a network element located at the egress boundary

of the network to allow the SONET network disclosed by Huang to communicate with an Ethernet network connected to the network element.

56. With regard to claim 73, while the system disclosed by Huang shows substantial features of the claimed invention (discussed above), it fails to disclose removing a CDL header and replacing it with an Ethernet preamble.

However, the preamble of an Ethernet packet is well-known in the art and predefined. Since a packet cannot travel over a standard Ethernet network without having a preamble, it is essential to replace the preamble of the packet if the packet must be forwarded over an Ethernet network. This would occur at a router located at an egress boundary of the network disclosed by Huang since the preamble must be replaced in order to travel over a standard Ethernet network.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to allow an Ethernet packet which has been previously modified to provide support for network management to be converted back into a standard Ethernet packet by replacing the management header with a standard Ethernet preamble.

57. Claims 3-7,14,15,19-21,52,55,58,60-64, and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang in view of Masucci et al. (US, 6,498,667).

58. With regard to claim 3, while the system disclosed by Huang shows substantial features of the claimed invention (discussed above), it fails to disclose that the network management includes operations, administration, and maintenance.

Masucci et al. disclose an OAM&P message (Col 10, Lines 56-59) used for network management on an optical network. It would be advantageous to add these fields to the header disclosed by Huang, since they allow a greater amount of control with regard to network management.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the header fields disclosed by Masucci et al. to the header disclosed by Huang since they provide a greater degree of control over the network management process, and allow more information to be transferred between the network devices.

59. With regard to claim 4, while the system disclosed by Huang shows substantial features of the claimed invention (discussed above), it fails to disclose that the header comprises an OAM channel and further comprising transmitting OAM information from the network element to a network management station.

The use of network management stations (NMS) is well known in the art as a means for providing a single point for the network administrator to configure and monitor the network. While Huang does not specifically disclose the presence of a NMS on the network, they are commonly used. It would be advantageous to utilize an NMS and send OAM information from the network device to the NMS. This will allow the network administrator to access the information from the NMS and take appropriate action.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use an NMS and to send OAM information to it from the

network device as a means for collecting the information in a central location for the network administrator to access.

60. With regard to claim 5, as discussed regarding claim 3, the header comprises an operations, administration, and maintenance channel. Masucci et al. further disclose transmitting operations, administration, and maintenance information from the network element to other network elements (remote terminals) (Col 12, Lines 34-42).

61. With regard to claim 6, Masucci et al. further disclose the provisioning of paths within the network (Col 10, Lines 23-25).

62. With regard to claim 7, Huang further discloses performance monitoring of paths within the network (congestion monitoring) (Page 4, Lines 1-3).

63. With regard to claim 14, while the system disclosed by Huang shows substantial features of the claimed invention (discussed above), it fails to disclose that the header includes a message channel.

Masucci et al. disclose an OAM&P message (Col 10, Lines 56-59) with a message channel (Fig 8, 402) used for network management on an optical network. It would be advantageous to add a message channel to the header disclosed by Huang, since they allow a greater amount of control with regard to network management by supporting large message transfer.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add a message channel to the header disclosed by Masucci et al. to the header disclosed by Huang since they provide a greater degree of

control over the network management process, and allow more information to be transferred between the network devices through messages.

64. With regard to claim 15, while the system disclosed by Huang in view of Masucci et al. shows substantial features of the claimed invention (discussed above), it fails to disclose that HDLC is used on the message channel.

HDLC is a common layer 2 protocol with a frame structure for handling both data and control messages. It is a standard way of framing packets, and would be an adequate choice for framing the packets on the message channel. Using a standard protocol such as HDLC make implementation easier since many tools would already be available for HDLC implementations.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use HDLC on the message channel since HDLC is a well-known protocol with existing tools to make implementation easier.

65. With regard to claim 19, while the system disclosed by Huang shows substantial features of the claimed invention (discussed above), it fails to disclose providing sideband communication within the network via a sideband channel.

Masucci et al. teach the providing a sideband channel to an optical network for the communication of management data (Col 10, Lines 56-59). This allows management data to be transmitted on a dedicated channel between network devices, ensuring that all information can be transmitted in a timely manner regardless of the amount of other data which must be transmitted.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a sideband channel for communication within the network. This allows network management information to be transmitted in a timely manner, regardless of the network congestion.

66. With regard to claim 20, Masucci et al. disclose that management data is transmitted over the sideband channel and the OAM&P messages have an IOT address to identify the station they are headed to. The use of IP routing on the sideband channel is not disclosed.

However, the IP routing is well known in the art and could be substituted for the IOT address disclosed by Masucci et al. This would provide the advantage of being able to use the IP address of the destination rather than the IOT address. This information is already in the packet, and the IOT field could be removed, reducing the packet size.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use IP routing on the sideband channel since the addressing information is already available via the packet. This could reduce the size of the packet by removing the IOT field as well as standardizing the addressing information on the network.

67. With regard to claim 21, while the invention disclosed by Huang in view of Masucci et al. shows substantial features of the claimed invention (discussed above), it fails to disclose using the sideband channel to perform topology discovery.

In many cases it is useful to determine the topology of the network a device is

located on, and many topology discovery methods are well known in the art. Performing topology discovery on the sideband channel would allow the topology of the network to be determined simultaneously with other data transfer without creating additional congestion in the network since the sideband channel is dedicated.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform topology discovery on the sideband channel. This allows the network topology to be determined without creating additional traffic on the network since the discovery can be performed on the dedicated sideband channel.

68. With regard to claim 52, while the system disclosed by Huang shows substantial features of the claimed invention (discussed above),it fails to disclose that the header contains an OAM field, message field, or application specific field. Huang does disclose the existence of a header error detection field (CRC) (Page 2, Section 2.1.1).

Masucci et al. disclose an OAM&P message consisting of an operations, administration, and maintenance field (400), a message channel (402), and an application specific field (opcode) (406). These fields allow different operations to be performed base upon the values in each field. It would be advantageous to add these fields to the header disclosed by Huang, since they allow a greater amount of control with regard to network management.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the header fields disclosed by Masucci et al. to the header disclosed by Huang since they provide a greater degree of control over the

network management process, and allow more information to be transferred between the network devices.

69. With regard to claim 55, while the system disclosed by Huang shows substantial features of the claimed invention (discussed above), it fails to disclose providing sideband communication within the network via a sideband channel.

Masucci et al. teach the providing a sideband channel to an optical network for the communication of management data (Col 10, Lines 56-59). This allows management data to be transmitted on a dedicated channel between network devices, ensuring that all information can be transmitted in a timely manner regardless of the amount of other data which must be transmitted.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a sideband channel for communication within the network. This allows network management information to be transmitted in a timely manner, regardless of the network congestion.

70. With regard to claim 58, Huang discloses a system for supporting network management, the system comprising a handler operable to remove a preamble from an Ethernet packet and insert a header (discussed regarding claim 1). Huang fails to disclose that the header contains an OAM field, message field, or application specific field. Huang does disclose the existence of a header error detection field (CRC) (Page 2, Section 2.1.1).

Masucci et al. disclose an OAM&P message consisting of an operations,

administration, and maintenance field (400), a message channel (402), and an application specific field (opcode) (406). These fields allow different operations to be performed base upon the values in each field. It would be advantageous to add these fields to the header disclosed by Huang, since they allow a greater amount of control with regard to network management.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the header fields disclosed by Masucci et al. to the header disclosed by Huang since they provide a greater degree of control over the network management process, and allow more information to be transferred between the network devices.

71. With regard to claim 60, while the system disclosed by Huang shows substantial features of the claimed invention (discussed above), it fails to disclose transmitting a defect indicator within said header that instructs a receiving node to switch to a backup path.

Huang does disclose a congestion notification field used to indicate congestion experienced along the link, to allow the receiving node to take action to avoid the congestion. It would be an advantageous and natural extension to indicate other defects detected on a link and have the receiving station switch to a backup path to alleviate congestion or ensure connectivity in the event of a failed link.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to transmit a defect indicator within said header and switch

a receiving node to a backup path in the event that a major defect such as severe congestion or a failed link is detected.

72. With regard to claim 61, Huang further discloses a subinterface identifier which identifier for use in demultiplexing packet streams (Src Port field) (Page 3, Section 2.1.1.2, Lines 5-7). Huang does not specifically disclose the step of demultiplexing, but the packet streams must be demultiplexed at the receiving node in order to be read. Therefore, this feature is present in the system disclosed by Huang despite the lack of a specific reference.

73. With regard to claim 62, Huang further discloses that the header error detection field is a header cyclic redundancy check (CRC-16) (Page 2, Section 2.1.1, Lines 11-12).

74. With regard to claim 63, while the system disclosed by Huang in view of Masucci et al. shows substantial features of the claimed invention (discussed above), it fails to disclose that the header includes fields for SRP.

However, SRP is a well-known protocol for use with ring based media, as disclosed by Applicant on page 33, Lines 16-19 of the present application. Adding these fields to the header would be advantageous because it would allow the SRP protocol to be run on the network.

Therefore, it would have been obvious to one of ordinary skill in the art a the time the invention was made to add header fields for SRP in order to allow the SRP protocol to be implemented on the system disclosed by Huang in view of Masucci et al. This would provide the benefits of the SRP protocol to this network.

75. With regard to claim 64, Huang discloses a system for supporting network management, the system comprising a handler operable to wrap a digital wrapper around a data link layer (Ethernet MAC frame) (discussed regarding claim 1). Huang fails to disclose that the header contains an OAM field, message field, or application specific field. Huang does disclose the existence of a header error detection field (CRC) (Page 2, Section 2.1.1).

Masucci et al. disclose an OAM&P message consisting of an operations, administration, and maintenance field (400), a message channel (402), and an application specific field (opcode) (406). These fields allow different operations to be performed base upon the values in each field. It would be advantageous to add these fields to the header disclosed by Huang, since they allow a greater amount of control with regard to network management.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the header fields disclosed by Masucci et al. to the header disclosed by Huang since they provide a greater degree of control over the network management process, and allow more information to be transferred between the network devices.

76. With regard to claim 71, Huang discloses a system for supporting network management, the system comprising a handler operable to remove a preamble from an Ethernet packet and insert a header (discussed regarding claim 65). Huang fails to disclose that the header contains a CDL header (OAM field, message field, or

application specific field). Huang does disclose the existence of a header error detection field (CRC) (Page 2, Section 2.1.1).

Masucci et al. disclose an OAM&P message consisting of an operations, administration, and maintenance field (400), a message channel (402), and an application specific field (opcode) (406). These fields allow different operations to be performed base upon the values in each field. It would be advantageous to add these fields to the header disclosed by Huang, since they allow a greater amount of control with regard to network management.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the header fields disclosed by Masucci et al. to the header disclosed by Huang since they provide a greater degree of control over the network management process, and allow more information to be transferred between the network devices.

77. Claims 8, 9, and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang in view of Hausman et al (US 5,872,920).

78. With regard to claims 8 and 9, while the system disclosed by Huang shows substantial features of the claimed invention (discussed above), it fails to disclose that the header includes the same number or fewer bytes than the preamble of the Ethernet packet so that the size of the packet is not increased when the preamble is replaced by the header.

Hausman teaches the use of the preamble portion of an Ethernet packet for the

transmission of other data (Col 3, Lines 48-61 and Fig 3). Prior to transmitting the packet over an Ethernet network, the standard Ethernet preamble is replaced. By limiting the size of the header to be the same as the preamble, the packet size remains constant and will fit in the same buffer as an Ethernet packet.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to limit the size of the header to be less than or equal to the size of an Ethernet preamble. This will ensure that the new packets can fit in the same buffer as an Ethernet packet and make modifying them easier. It would be particularly advantageous to set the length of the header to be exactly 8 bytes since that is the length of a standard Ethernet preamble. That way the preamble could be easily removed or replaced by simply overwriting the first 8 bytes of the packet.

79. Claim 59 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huang in view of Masucci et al. (US 6,498,667) in further view of Hausman et al. (US 5,872,920).

80. With regard to claim 59, while the system disclosed by Huang in view of Masucci et al. shows substantial features of the claimed invention (discussed above), it fails to disclose that the header includes the same number or fewer bytes than the preamble of the Ethernet packet so that the size of the packet is not increased when the preamble is replaced by the header.

Hausman teaches the use of the preamble portion of an Ethernet packet for the

transmission of other data (Col 3, Lines 48-61 and Fig 3). Prior to transmitting the packet over an Ethernet network, the standard Ethernet preamble is replaced. By limiting the size of the header to be the same as the preamble, the packet size remains constant and will fit in the same buffer as an Ethernet packet.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to limit the size of the header to be less than or equal to the size of an Ethernet preamble. This will ensure that the new packets can fit in the same buffer as an Ethernet packet and make modifying them easier. It would be particularly advantageous to set the length of the header to be exactly 8 bytes since that is the length of a standard Ethernet preamble. That way the preamble could be easily removed or replaced by simply overwriting the first 8 bytes of the packet.

81. Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang in view of Maruyama.

82. With regard to claims 22 and 23, while the system disclosed by Huang shows substantial features of the claimed invention (discussed above), it fails to specifically disclose the network having a hub or mesh topology.

Maruyama discloses a SONET network that can be used for interconnecting LANs. Maruyama discloses that the SONET network may be in any topology, including hub (star) and mesh (Page 9, Lines 3-4). Since the system disclosed by Huang is directed toward SONET networks, and the network disclosed by Maruyama is a SONET network, it would be advantageous to allow the system disclosed by Huang to be

implemented on SONET networks in hub or mesh topologies. In the case where the LANs disclosed by Maruyama are Ethernet LANs, which are the most common, it would be especially advantageous since Huang's system allows SONET networks to interact with Ethernet networks to transfer Ethernet traffic over the SONET network.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to allow the system disclosed by Huang to be implemented on hub and mesh topologies, since some SONET networks are implemented in these topologies and it would be advantageous to allow these topologies to use the system disclosed by Huang to interact with Ethernet networks.

83. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron Strange whose telephone number is 703-305-8878. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glen Burgess can be reached on 703-305-4792. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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